

The Impact of the Alternative Tax Base Measurement Policy on the VAT Revenue Performance in the Indonesian Agricultural Sector

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ABSTRACT

Informality issues and government distributional objectives cause the need for VAT special treatment for the agricultural sector. The treatment forms and resulting impacts vary, depending on each country's conditions and necessities. This study aims to estimate the impact of the alternative tax base measurement policies on the VAT revenue performance in the Indonesian agricultural sector. Using input-output table modeling, the authors found that the policy positively impacts the compliance level and VAT revenue in the agricultural sector but reduces the aggregate national VAT revenues and increases the VAT burden that the agricultural sector entrepreneurs must bear. The normal VAT mechanism is preferred for the long-term goal, but the alternative policy is still needed during the transition period.

Keywords: VAT revenue performance, VAT compliance level, agricultural sector, input-output model

1. INTRODUCTION

VAT imposition on the agricultural sector is often considered difficult due to two main factors, informality and government distribution objectives. The agricultural sector is generally dominated by small farmers who do not keep records of their business activities, and only a small proportion of large farmers do it properly. This condition creates administrative problems that cause normal VAT provisions cannot to be fully applied. The agricultural sector is also a source of livelihood for most low-income groups. Its production is needed to fulfill public consumption, production inputs for other business sectors, and essential commodities for export purposes. For distribution purposes and other political considerations, the government can stipulate a special VAT treatment for this critical sector.

Most countries broadly exclude the agricultural sector from the VAT imposition, and only a few countries have fully taxed this sector. The developed countries that have fully imposed VAT on the agricultural sector, such as New Zealand and Denmark, are not entirely encouraging that the special VAT treatment of agriculture is not inevitable (Ebrill et al., 2001). The VAT treatment practice in the agricultural sector varies among countries, adjusting to the conditions and necessities of the country. The question of what form of VAT treatment is proper for the agricultural sector and how effective its impacts are in optimizing VAT revenue still needs to be answered. Although the regular treatment of VAT equates to other business sectors in the long term has become a clear goal. However, during the transition period, the high costs of administration

and collection, distribution objectives, and political considerations are still a strong argument for giving special treatment to this vital sector.

This study will estimate the impact of VAT policies on the Indonesian agricultural sector, which provides an alternative basis for imposing VAT on certain agricultural commodities. This provision is regulated in the Minister of Finance Regulation number 89 of 2020, which has been in effect since July 2020. This treatment is a different policy design from the regular VAT regulations. This policy gives taxable entrepreneurs options to choose the method of calculating the tax imposition basis on the delivery of certain agricultural products, whether to continue using the selling price or switch to using another value of 10% of the selling price but lose the right to credit input tax. This change in VAT policy can influence the economic decisions of the affected producers and consumers, change the basis of VAT, and ultimately impact the VAT revenue that the government can collect.

This policy is intended to solve the problem of imposing VAT on the Indonesian agricultural sector. Applying the normal VAT mechanism after the Supreme Court granted the judicial review of the VAT exemption facility for agricultural products in 2013 creates difficulty in fulfilling VAT obligations, especially for farmers/taxable entrepreneurs with administrative issues and a limited understanding of tax provisions. They can choose to use an alternative method that is simpler, no longer required to account for input VAT, with a lower effective rate. Meanwhile, the standard mechanism for crediting input VAT can still be used by farmers/taxable entrepreneurs who need it. This policy is expected to accommodate the needs of all taxable entrepreneurs in the agricultural sector, thereby increasing compliance and VAT revenue in the agricultural sector, which has yet to be optimal.

Based on previous studies, various factors affect a country's VAT revenue performance. The interaction between tax structure (tariff, tax base, and threshold), taxable economic activity, and

compliance with tax regulations play an essential role in determining the performance of VAT revenue (Ebrill et al., 2001). Tax rate, tax knowledge, and perceived fairness are several factors, among others, that affect the level of compliance, according to a review by Kirchler et al. (2008) of the existing literature. The marginal tax rate has a mixed empirical impact on compliance (see Alm et al., 1992; Baldry, 1987; Park & Hyun, 2003). Reduces complexity and increases tax knowledge has a positive impact on compliance (Clotfelter, 1983; Kirchler & Maciejovsky, 2001). Perceived as a fair tax system will increase trust and boost voluntary tax compliance (Braithwaite, 2003; Wenzel & Thielmann, 2006).

Single tariff and broad consumption base are characteristics of an exemplary structure of the VAT system (James, 2015). This can lower efficiency costs and simplify administrations because the tax authority does not have to allocate its limited resources to identify different economic activities with different treatments (Bird & Gendron, 2006). The complex tax system and narrow tax base will reduce VAT collection efficiency (Bogetic & Hassan, 1993). The higher VAT rates could be associated with lower compliance, and the use of multiple rates has an adverse effect on compliance (Agha & Haughton, 1996). Furthermore, political and economic structural factors (such as the level of urbanization, the share of the agriculture sector, and the degree of economic openness) impact the performance of VAT revenue in a country (Aizenman & Jinjarak, 2008).

The study conducted by Iswahyudi (2018) shows that the decline in the VAT revenue performance in Indonesia was mainly influenced by VAT expenditure policies and taxpayers' non-compliance. Reducing the scope of VAT exemptions and simplifying the VAT system with the application of a single VAT rate can have a positive impact on VAT collection. Sugana and Hidayat (2014), in a study of the potential and tax gaps in VAT revenue, show that increasing the compliance level has a higher positive impact on VAT revenue than increasing the VAT rate. These

two studies show that a simple VAT system and increased compliance levels are essential in improving VAT revenue performance in Indonesia.

The special treatment of VAT in the Indonesian agricultural sector allows two methods of imposing VAT on the delivery of a specific agricultural product: normal and other value methods. Taxable Entrepreneurs have a right to decide what method they will use. The other value methods offer lower effective rates because the right to credit input VAT is forfeited. This makes the alternative method simpler because the administration of input VAT, considered onerous and complicated for some Taxable Entrepreneurs in the agricultural sector, is no longer needed. The existence of method options offered makes this policy fairer because the Taxable Entrepreneur can assign a method that best suits their individual needs and tax administration capacities. However, this method's options yield effective VAT rate differences in selling the same agricultural product.

The impact of the special treatment on VAT revenue performance cannot be concluded using the previous studies finding. This happens because of contrary impacts interaction caused by the policy change. Simplified VAT administration, lower effective rates, and a fairer VAT policy for all agricultural sector entrepreneurs can positively impact VAT compliance and revenue performance. On the other hand, the tariff differences for the same agricultural products can distort the decisions of economic agents, increasing the complexity of fulfilling obligations and administering taxes, which negatively impacts VAT compliance and revenue performance. The option methods for imposing VAT on certain agricultural products allow for mixed effects on VAT revenue in the agricultural sector.

The alternative method of VAT imposition is a deviation from the normal VAT provisions. The smaller tax base due to alternative methods potentially reduces VAT revenues. However, VAT on production inputs that cannot be credited will be an additional government revenue from production activities, which should not be intended

to be subject to VAT as a consumption tax. This non-creditable input VAT also can increase the tax base if added as a component of the selling price and has a cascading effect at the production, distribution, and final consumption stages. The impact of this policy on VAT revenues is the net accounting effect of the increases and decreases in the revenue generated.

This study aims to estimate the impact of alternative tax base measurement on VAT revenue and assess the magnitude tax gap between VAT theoretical collections and VAT actual collections in the agricultural sector. The VAT treatment in the Indonesian agricultural sector is one of the various forms of special VAT treatment in the agricultural sector. The impact on the VAT revenue performance cannot be concluded using the previous studies finding. The study results are expected to provide a basis for evaluating and formulating VAT policies in the agricultural sector that require special treatment depending on their characteristics to optimize the potential VAT revenues as a source of financing for development and prosperity programs.

2. THEORETICAL FRAMEWORK AND DEVELOPMENT OF THE RESEARCH MODEL

2.1 Theoretical Framework

Taxation has an important role for the government in managing the country's economy through fiscal policy. Fiscal policy is the government's effort to use its revenues and expenditures to influence the country's macroeconomic conditions. Even more broadly, according to Keynesians, fiscal policy can affect aggregate demand and the level of economic activity. Taxation is an essential factor from the revenue side in fiscal policy. Changes in tax policy adopted by the government may lead to changes in aggregate demand and the level of economic activity in the affected sectors, including other related sectors, thereby resulting in aggregate changes at the national level. When the government raises/lowers taxes, it will impact decreasing/increasing the aggregate level of

consumption, production, and investment nationally.

Taxation has a vital function as revenue adequacy to ensure that government revenues are sufficient to finance the government's expenditure over time. If failed to do so, the government must resort to borrowing, printing money, selling assets, or slowing down the implementation of development programs. These actions will ultimately harm people, especially people with low incomes. In addition, taxation also plays a role in revenue stability to maintain the continuity of the government's fiscal policies. So, it is crucial to have a tax system that is effective in collecting revenue and efficient because it does not distort economic activity to ensure a healthy budget policy in financing development and welfare programs over time.

The scope of the tax base, tax rates, and the level of tax compliance strongly influence the performance of tax revenues in a country. Tax policy changes will impact the tax revenue level that the government will collect. For example, when the government increases/decreases VAT rates, the direct impact is an increase/decrease in tax revenue on the same tax basis. While the indirect effect is due to an increase/decrease in prices due to an increase/decrease in tax rates, which will reduce/increase aggregate consumption and production, which means a decrease/increase in the tax base. Thus, how much tax revenue is generated from a tax policy change depends on comparing the direct and indirect impacts. A good tax policy can create opportunities/distortions for taxpayers, leading to more productive efforts, not just tax planning to reduce the tax burden.

The new policy may impact the aggregate demand and supply of agricultural commodities through the price changes mechanism due to changes in the effective tax rate. The provision of an alternative measurement of the tax base will impact the size of the VAT base. With a single statutory VAT rate of 10%, the change in the tax base from the selling price to another value (10% of the selling price) causes a change in the effective tax rate to 1% of the selling price. Because this is optional, there will be differences in effective VAT rates on certain agricultural commodities, which

will cause price differences that can distort economic decisions from both the producer and consumer sides and will change aggregate demand and supply nationally.

The new policy will also cause differences in the value of VAT paid by taxable entrepreneurs on the sale of certain agricultural products, which will impact the VAT revenues that the government will collect. The VAT that must be paid using the normal mechanism is $(10\% \times \text{selling price}) - \text{input tax on production inputs}$. Meanwhile, VAT that must be paid using another value mechanism is $(10\% \times (10\% \times \text{selling price}))$ or 1% of the selling price without considering the input tax. The burden of the non-creditable input tax can be transferred to the consumer through the selling price component or will be borne by the producer as a profit deduction. These two conditions will increase VAT revenue because the input tax will become the basis for further VAT taxation (cascading effect), or there will be taxation at the producer level, which is not statutorily the subject who should bear the VAT burden.

The options offered by the VAT policy can be considered in tax planning for producers and consumers to maximize their respective utilities. Producers will choose a VAT collection method to maximize profit to minimize the tax and administrative burden they have to bear. Meanwhile, consumers will choose products that provide the same level of benefits with minimum sacrifice (lower price plus VAT) to maximize utility. The choice of VAT collection method taken by producers will impact the choice of products that consumers will buy. The interaction of these choices in the aggregate will impact the basis and revenue of VAT from the agricultural sector that the government will collect.

The VAT revenue that the government will collect due to changes in VAT policy in the agricultural sector will technically be significantly influenced by the large proportion of Taxable Entrepreneurs who switch to using alternative mechanisms. The greater the proportion of using other values as the basis for imposing VAT, the greater the potential for a decrease in VAT revenue due to a lower effective VAT rate. On the other hand, there will be additional government revenue

from VAT on production inputs that the Taxable Entrepreneur cannot credit. This non-creditable input VAT also can increase the VAT base when the Taxable Entrepreneur can transfer the burden of input VAT to the buyer by adding it to the selling price component. The more inelastic the demand for price changes, the larger the opportunity to transfer the burden of input VAT to consumers. The addition of VAT revenue from the cascading of input tax will be even greater when the production and distribution chain takes longer to deliver to the final consumer (Ebrill et al., 2001). The impact of this policy on VAT revenue is the net value of the increase and decrease in revenue that occurs.

2.2 Research Model Development

VAT applicable in Indonesia has several main characteristics. VAT is a tax on consumption that is imposed in stages on each production and distribution line until final consumption. To avoid the effect of double taxation, VAT applies a crediting mechanism. As an indirect tax, the seller acts as the person responsible for the tax, but the consumer is the party who bears the tax burden. The VAT negative list principle defines that all goods and services are goods and services subject to VAT at a single rate unless otherwise stipulated by law. The destination principle is applied by imposing VAT on domestic consumption and imports and applying zero tariffs to exports. In addition, VAT also provides some VAT exemptions and facilities for particular commodities or sectors.

Three approaches are commonly used in VAT modeling: the aggregate national account approach, the sectoral national account approach, and the input-output table approach (Jenkins et al., 2000). The three approaches should yield consistent results in projected VAT revenues and compliance rates. However, since I-O tables provide the most detailed accounting data for supply and use and final consumption in an economy, I-O VAT modeling can be considered the best approach for estimating the disaggregated impact on VAT collection and compliance at the commodity level due to policy changes (Le, 2007).

Many studies use I-O modeling for various purposes; among others, Jenkins et. al (2000) developed an I-O model to estimate the tax base and simulated revenue based on data and the case in Canada, which carried out tax reform from sales tax to VAT. Le (2007) develops an IO model for estimating the VAT basis considering the impact of small businesses' outputs and inputs with turnover below a predetermined VAT threshold for Romania. Manasan (2002) formulates an I-O model to estimate the performance indicators of VAT revenue for each industrial sector in the Philippines. Warwick et al. (2022) use input-output tables to estimate the impact of VAT exemptions on consumer prices because VAT is attached to the supply chain. Then it is incorporated with a microsimulation model to estimate the impact of VAT policies on tax revenues, inequality, and poverty.

Marks (2003) used the I-O modeling approach to calculate potential VAT revenue in Indonesia. He uses the 1995 I-O table to estimate the impact of the VAT exemption policies on certain goods and services widely practiced in Indonesia on the performance of VAT revenue. The result shows that the potential VAT revenue in Indonesia is 5.83% of the GDP. However, the actual revenue collected is only 3.2%. Eliminating VAT exemptions in some sectors did not generate much additional revenue but reduced revenues in others. Sugana and Hidayat (2014) estimate the level of revenue and compliance of VAT using the 2008 I-O table for validating the compliance rate in the study conducted by Marks (2003). They make adjustments in determining the proportion of taxables, the level of compliance, and the tax year studied. The result is that the VAT revenue estimated in the 2013 fiscal year is Rp381 trillion, which is only less than 1% of actual revenue and a compliance rate of 53%.

This study extends the model built by Sugana and Hidayat (2014) because the model is considered the most proper and allows for some adjustments to accommodate the objectives of this study. In this study, the authors added alternative methods proportion to estimate the impact of the alternative policy and simulate cascading effects when taxable entrepreneurs can transfer the

burden of uncreditable input VAT to buyers. In addition, adjustments were made in determining the taxable proportion and below threshold proportion, using the latest input-output tables and utilizing available DGT administrative data.

3. RESEARCH METHODOLOGY

This study tries to adopt and use the principles of the I-O model formation based on the study of Sugana and Hidayat (2014) by incorporating the alternative treatment of VAT in the agricultural sector and using the latest I-O table data in 2016. This study also utilizes administrative data from the DGT in estimating the proportion of taxable entrepreneurs who switch to using alternative methods to analyze the impact of policies on VAT revenue and compliance. The research period is the 2021 tax year because it is the period after the policy was issued, including the first month of a tax year when the transition to the use of the alternative method is allowed, and the transition period from the effects of the COVID-19 pandemic.

This study uses the 2016 I-O table, which contains the input and output of 185 business sectors, which are then projected to get a value that can reflect the conditions of the 2021 projection year. The gross-up factor is needed to protect the value of final household expenditure, gross fixed capital formation, and intermediate inputs in 2021 based on I-O table data in 2016. The gross-up factor is obtained by comparing the GDP value of each business sector in the projection year with the base year using the formula as follows:

$$G_i = \frac{GDP_{i,t}}{GDP_{i,0}} \quad (1)$$

G_i : Gross up factor of commodity i

$GDP_{i,t}$: GDP of commodity i in the projected year

$GDP_{i,0}$: GDP of commodity i in the base year

The gross up factor then used to project the value of final consumption, intermediate inputs, and fixed capital formation as follows:

$$C_{i,t} = G_i \times C_{i,0} \quad (2)$$

$C_{i,t}$: Final consumption in the projected year

$C_{i,0}$: Final consumption in the base year

$$Int_{i,t} = G_i \times Int_{i,0} \quad (3)$$

$Int_{i,t}$: Intermediates input in the projected year

$Int_{i,0}$: Intermediates input in the base year

$$I_{i,t} = G_i \times I_{i,0} \quad (4)$$

$I_{i,t}$: Capital formation in the projected year

$I_{i,0}$: Capital formation in the base year

The first step is to estimate the adequate VAT base from the three main components of the I-O table, namely the supply matrix, use matrix, and final demand matrix. The final demand data needs to be adjusted to exclude the proportion of exempted goods and services, subject to zero tariffs, exempted, and borne by the government. Furthermore, the authors also consider the proportion of final demand sold by non-taxable entrepreneurs or entrepreneurs with a turnover below the threshold. So that the adequate VAT base is obtained from the final demand data that will be subject to VAT as follows:

$$B_{Ci} = C_i * \rho_i * (1 - \pi_i) * ((1 - A_i)(1 - DPP_i) + DPP_i) \quad (5)$$

B_{Ci} : Taxable final demand base of sector i

C_i : Total final demand of sector i

ρ_i : Taxable proportion of sector i

π_i : Non taxable entrepreneur proportion of sector i

A_i : Proportion of using the alternative mechanism of sector i

DPP_i : Proportion of alternative tax imposition basis of sector i

The taxable proportion (ρ_i) will be 1 if all commodities in a sector are subject to VAT, and 0 if otherwise. If only a part of the commodities is

subject to or excluded, then it can contain a value between 0 to 1. The non-taxable entrepreneur proportion π_i is based on the proportion of value added of micro and small businesses in each business sector, assuming that small entrepreneurs with turnover below the threshold are not taxable entrepreneurs. The proportion of using the alternative mechanism (A_i) is estimated based on the applicable VAT provisions and available DGT administrative data. A_i will be worth 0 if there is no alternative mechanism based on applicable regulations, and 1 if otherwise. The existence of a basis option for imposing VAT on certain commodities in the agricultural sector allows A_i to be worth between 0 to 1. The proportion of the alternative tax base imposition (DPP_i) is determined based on the applicable VAT regulations.

The taxable proportion of the supply and use matrix between business sectors consists of taxable inputs used by non-taxable entrepreneurs and taxable entrepreneurs who produce commodities that are excluded and exempt from VAT because they cannot credit the input tax, so they are treated as final consumption. It is also necessary to consider the VAT regime that applies to intermediate inputs and who sold them. Consideration of the VAT mechanism used will also impact how large the VAT basis from intermediate inputs must be taken into account in the model. Intermediate inputs used by taxable entrepreneurs that use other value mechanisms will increase the taxable intermediate input base. Meanwhile, intermediate inputs purchased from taxable entrepreneurs using other value mechanisms will reduce the taxable intermediate input base. The taxable basis of intermediate inputs can be formulated as follows:

$$B_{Inpj} = (\text{Max}((1 - \rho_j); \pi_j) + A_j) * \sum_i^n (\rho_i * (1 - \pi_i) * ((1 - A_i)(1 - DPP_i) + DPP_i) * \frac{Inp_{j,i}}{Inp_j} \quad (6)$$

B_{Inpj} : Taxable intermediate input base of sector j

Inp_j : Total intermediate input of sector j

$Inp_{j,i}$: Total intermediate input of sector j from sector i

ρ_i : Taxable proportion of intermediate input sector i

π_i : Non taxable entrepreneur proportion of intermediate input sector i

A_i : Proportion of using the alternative mechanism of sector i

DPP_i : Proportion of alternative tax imposition basis of sector i

ρ_j : Proportion of taxable output generated by sector j

π_j : Proportion of output sold by non taxable entrepreneur in sector j

A_j : Proportion of using the alternative mechanism of sector j

The fixed capital formation and investment is not a VAT basis, because taxable entrepreneurs can credit input tax on the transaction. The fixed capital formation includes the construction of business places, the purchase of machinery and equipment, or the purchase of livestock seeds. However, if non-taxable entrepreneurs carry it out, the fixed capital formation will be considered an object of VAT so that it will be treated the same as intermediate inputs. The purchase of new housing by households is an object of VAT and is included in the component of fixed capital formation in the I-O table, so it must be added as a tax base by making adjustments to the land value that has not been taken into account in the I-O table.

The above steps will result in an effective VAT base of final demand, intermediate inputs, and fixed capital formation. The effective basis of VAT when multiplied by the applicable VAT rate, the potential VAT revenue will be obtained at a full compliance rate of 100%.

$$VAT_i = B_i \times t \quad (7)$$

The difference between the actual administrative data of VAT revenue and the potential VAT revenue from the estimated model is a tax gap that shows the level of taxable

entrepreneur compliance in carrying out VAT obligations correctly.

$$K_i = \frac{R_i^A}{R_i^P} \quad (8)$$

K_i : Compliance rate of commodity i

R_i^A : Actual VAT revenue of commodity i

R_i^P : Potential VAT revenue of commodity i

The impact of the alternative policy of measurement VAT imposition basis on VAT revenue in the agricultural sector is carried out by comparing the results of the estimation of potential VAT revenue at the full compliance rate between conditions that exist in 2021 with simulation results when there is no policy and when the policy is fully mandatory, not as an option for the taxable entrepreneur. Meanwhile, the gap between theoretical and actual revenue that represents the agricultural sector's compliance rate is measured by comparing the level of compliance in 2021 with the level of compliance in the previous year, where this alternative policy was not implemented.

4. RESULTS AND DISCUSSION

4.1 Data Preparation

The gross-up factor is obtained by comparing the value of sectoral GDP in 2021 with 2016 as the base year. This method does not consider changes in the technical coefficients which indicate changes in technology, prices, and classifications used. However, the projected value is assumed to represent the conditions of the projection year so that it can be used to measure the impact of alternative policies on revenue and compliance levels. The gross-up factor is needed to estimate the value of final household consumption, gross fixed capital formation, and intermediate inputs at the aggregate level of each sector in the projected year. The estimated final consumption and gross fixed capital formation values were then adjusted based on the aggregate expenditure data reported by the Central Bureau of Statistics.

The taxable proportion is determined based on the technical, applicable VAT regulations and administrative issues. There are 42 sectors in which the taxable proportion is 0 because all of the outputs are exempt from VAT and 22 sectors in which only part of the output is subject to/excluded from VAT so that the taxable proportion is between 0 and 1. The last discussed taxable proportion is calculated using DGT administrative data derived from the VAT period report. This proportion is obtained by dividing the total sales that are excluded, exempted, and not collected from VAT by the total amount of sales reported by taxable entrepreneurs for each Classification of Business Fields (KLU). The data used only covers sales made by registered entrepreneurs, and there is no incentive for taxable entrepreneurs to report sales that are excluded from VAT. So that the proportion obtained will be more significant than if the data on sales made by non-PKP are available and included in the calculation. However, the resulting value is assumed to be sufficient to represent the actual condition.

The proportion of entrepreneurs falling below the VAT threshold was determined by analyzing the 2016 economic census data. This involved comparing the income data of Micro and Small Enterprises (MSEs) against the total income of MSEs and Large Medium Enterprises (LMEs) in each business sector. In addition, the proportions for the agriculture, forestry, and fishery sectors were determined using data available from the agricultural census. The proportion obtained is considered to reflect the portion of entrepreneurs who have a business turnover in one year less than the VAT threshold, which is 4.8 billion. It is assumed that small entrepreneurs with a turnover below the threshold are not taxable entrepreneurs. However, based on the applicable VAT provisions, they have the right to register as taxable entrepreneurs voluntarily.

The proportion of alternative methods is calculated using DGT administrative data obtained from tax invoices issued with code 04. This code indicates that the VAT for sale is calculated using

other values. According to the Minister of Finance Regulation number 89 of 2020, 27 sectors of the I-O table are entitled to use other values as the basis for imposing a VAT. Other provisions regulate the use of other values, but because the proportion is not significant, all sales in tax invoices with code 04 from the 27 sectors are assumed to be sales as regulated in the Minister of Finance regulation number 89 of 2020, which is then divided by the total taxable delivery of each sector.

4.2 Policy Impact on VAT Revenue

After obtaining the projected final household expenditure, gross fixed capital formation, and intermediate input for 2021, the data was incorporated into the previously established I-O model using the obtained proportions. This step will obtain an estimate of potential VAT revenue at the level of 100% compliance when alternative policies are applied. The next step is to conduct a simulation to see the VAT revenue potential if the policy is not applied and when specific agricultural sectors fully apply the policy. It is also significant to conduct a simulation by adding non-creditable VAT input to the selling price component to estimate the impact of the cascading effect. The impact of alternative policies on VAT revenues can be obtained by comparing the VAT revenue potential from those conditions, as shown in Appendix 1.

When the alternative method was used in 2021, the potential VAT revenue for the agricultural sector would be 0.35% higher than that generated under normal conditions. These conditions indicate that the policy can increase VAT revenues in the agricultural sector. However, cumulatively, the VAT revenue decreases by 0.01% due to the decrease in the revenue potential from the other business sectors, except the trading sector. The policy will increase the national revenue potential by 0.79% when the policy is fully implemented (no longer as an option for taxable entrepreneurs) in certain agricultural sectors. The two sectors experiencing an increase in revenue potential are business sectors that could apply the other value bases, while the others, experiencing a decrease in VAT

revenue potential, are sectors outside the Minister of Finance Regulation number 89 of 2020 but have links to the agricultural sector and trade in particular agricultural products.

The sectors for the supply of accommodation, food and drink, processing industry, and construction are the three sectors that have the greatest linkages to the agricultural sector, as seen from the increase in the proportion of other uses of value in the agricultural sector, causing a relatively significant decrease in the potential for VAT revenue compared to other business sectors. Meanwhile, other business sectors tend to be unaffected (relatively less than 1%) by changes in VAT policy in the agricultural sector, mainly the information and communications sector and real estate. The government may consider this when establishing VAT policies in the agricultural sector. Furthermore, it is important to assess its potential impact on related sectors.

When taxable entrepreneurs can transfer the input VAT burden to buyers through the price component, it will increase the VAT base, increasing the potential for government revenue. The revenue potential of all business sectors increases compared to the previous condition. This condition indicates a cascading effect from unrecovered VAT input. The impact of alternative policies on revenues is also higher, with the increase in VAT revenue from the agricultural sector being 0.36%, higher than when producers bore the VAT input burden. However, the cumulative policy impact is still negative, which means that the increase in revenue due to the cascading effect is still lower than the decrease in revenue due to using an alternative VAT basis.

Appendix 2 shows that the decrease in VAT potential revenue comes from consumption activities due to a decrease in the base of VAT imposition. Other values imposition base is smaller than the standard VAT provisions. It means that consumers will enjoy a decrease in the effective VAT rate so that the tax burden consumers must bear is relatively lower when consuming a commodity. Meanwhile, the increase of potential VAT revenue occurred in production activities due to the addition of the effective VAT basis from non-

Table 1 Policy Impact on VAT Revenue Agriculture Sub-Sector

Agriculture Sub-Sector	% Impact (VAT Rev. Condition 2021 vs No Alternative)			% Impact (VAT Rev. Full Alternative vs No Alternative)		
	Consumer	Business	Total	Consumer	Business	Total
Crops	-0,21%	-0,01%	-0,06%	-89,44%	48,32%	11,07%
Horticultural Plants	-5,84%	0,14%	-0,03%	-90,00%	5,08%	2,29%
Plantation crops	-1,03%	1,80%	1,70%	-90,00%	170,24%	160,58%
Forestry and Logging	-0,97%	3,37%	2,83%	-90,00%	174,34%	141,37%
Farm	0,00%	-0,19%	-0,19%	0,00%	-1,15%	-1,13%
Fishery	N/A	-0,17%	-0,17%	N/A	-0,30%	-0,30%
Agricultural and Hunting Services	0,00%	-0,09%	-0,09%	0,00%	-0,20%	-0,18%
Total	-0,79%	0,42%	0,35%	-75%	48%	42%

creditable input VAT. Producers will bear this additional VAT burden as a reduction in profits or will be transferred as an increase in selling prices which producers will bear in the next stage to the final consumer.

When producers can transfer the input VAT burden to buyers, cascading effect increases the potential state revenue. This increase comes from all economic agents. However, the impact of alternative policies in the agricultural sector is still negative on final consumption, while the business sectors and government expenditure experience an increase in revenue potential. Consumers benefit from this alternative policy, while producers have to bear more of the tax burden. This condition worsens the VAT regressivity for taxable entrepreneurs, mainly those with lower profits.

In the agricultural sector, the sub-sectors directly affected by alternative policies have decreased potential VAT revenues from consumption activities and increased VAT revenues from production activities, namely food crops, horticulture, plantation, and forestry. Meanwhile, the potential VAT revenue from consumption activities is not affected for the livestock, fishery, and agricultural services not covered by the alternative policies. The potential from production activities decreases slightly, as shown in Table 1.

This alternative policy could erode the VAT base and revenue from consumption activities and increase the VAT base and revenue from

production activities for the business sectors covered by the policy. Business sectors outside the scope of the policy will experience a decrease in potential VAT revenues from production activities, while potential revenues from consumption activities will not be affected. The greater the linkage of the business sector outside the scope of the policy to the business sectors listed in the policy, the more significant the negative impact of decreasing potential VAT revenue from production activities.

This condition clarifies the negative effect of alternative policies on the agricultural sector. Farmers/entrepreneurs in the agricultural sector must bear a more significant tax burden if they switch to using other value mechanisms. Meanwhile, entrepreneurs in other business sectors who use certain agricultural products as production inputs will benefit more because of the lower VAT burden they have to bear. This condition increases the unfair VAT treatment for entrepreneurs in the agricultural sector compared to entrepreneurs in other business sectors. Based on these considerations, the general VAT provisions remain a better choice for creating a fair and efficient VAT policy with minimum possible economic distortion.

However, under certain circumstances, this alternative policy is needed. It benefits farmers/small entrepreneurs, but due to limited administrative capabilities and understanding of tax provisions, they cannot implement the

standard VAT provisions properly. When the benefits of crediting input VAT are less than the administrative and compliance costs that must be borne, simpler provisions are preferable.

4.3 Policy Impact on Compliance Rate

The gap between actual revenue and potential revenue indicates a compliance rate determined by complex interaction factors such as tax policy regime, general tax culture, the effectiveness of tax administration, and mainly, tax evasion and avoidance tendencies (Le, 2007). Potential revenue is estimated using taxable proportion, proportion below the VAT threshold, and proportion using alternative methods determined based on data and applicable VAT policies. Meanwhile, not all Taxable Entrepreneurs comply with paying and reporting all taxable transactions. The realization of VAT payments may differ from the potential revenue that should be collected. The imbalance condition from both values reflects the level of taxpayer compliance.

The compliance rate can be ascertained through the ratio of actual revenue realized to the estimated potential revenue, constituting a full compliance rate. (Sugana & Hidayat, 2014). Although the potential revenue is estimated using a static model and does not consider changes in taxpayer behavior, the actual revenue realization will show the taxpayer's response to VAT policy changes, *ceteris paribus*. The revenue from each sector is obtained based on the VAT payments of each KLU sourced from DGT administrative data. The first step is to match 1626 sectors based on KLU with 185 sectors in the I-O table. This data is the realization of gross VAT revenue because it has yet to be deducted by the VAT overpayment that must be returned to the taxpayer. So that this data can reflect the rate of compliance of each business sector. Furthermore, it is then grouped into 17 sectors, as presented in Appendix 3.

The effects of the policy on the compliance rate are observable through inter-sectoral comparisons of compliance rate calculations across tax years. The year in which the latest I-O tables exist (2016) is suggested as the base year (Le, 2007). The compliance rate in 2020 is also used as

a comparison because it is the closest year when alternative policies have not been fully implemented, and 2019 was before the impact of the COVID-19 pandemic in Indonesia. The compliance rate of the agricultural sector in 2021 is 35.5%, higher than the compliance rate in previous years. This figure shows that alternative policies that are fully implemented in 2021 positively impact increasing the compliance rate in the agricultural sector, *ceteris paribus*.

There was a decrease in the compliance rate of the agricultural sector in 2020 and 2019 compared to the base year 2016 amid the outbreak of COVID-19 at the end of 2019 in several countries and Indonesia in early 2020. Due to the interconnectedness of global economic chains, economic changes due to a pandemic in a country will affect domestic economic conditions. For example, a decrease in demand for agricultural commodities in the importing country will impact the supply and prices of domestic products. Thus, changes to the VAT base will affect the potential VAT revenues. In addition, the uncertainty of the pandemic impact can affect changes in taxpayer behavior, which affects the actual VAT payment.

The compliance rate in total for 2021 is 65.6% shows that there is still a lot of potential VAT revenue to capture. This figure is lower than the compliance rate for the base year 2016 (66.1%). This condition shows that the additional complexity of the VAT system administration due to alternative policy harms the total compliance rate. In many cases, the compliance rate is substantially below 100%, but for some sectors, the compliance rate is above 100%. This condition may occur due to the intensification of tax collection programs or an increasing number of taxpayers. In addition, the I-O table only describes formal economic activities.

In contrast, the potential VAT from informal activities is difficult to estimate, so the actual revenue of a sector can exceed the estimated revenue potential. Besides, the weakness of the I-O model assumes a sector only produces one type of homogeneous output when it is possible to have more than one business activity with different VAT treatments. For example, the accommodation provision sector has no potential VAT revenue because the hotel services

delivered are exempt from VAT. However, it is possible to have other businesses, such as renting space for ATMs, which are subject to VAT.

Among the various agricultural sub-sectors, plantation crops demonstrated the most substantial surge in compliance rate and held the highest potential VAT revenue. The prominent commodities such as palm oil and rubber and the large and medium companies entering this sector support the higher compliance rate and VAT revenues. Meanwhile, livestock, food crops, and horticulture have low compliance. This condition can be driven by the high proportion of informal entrepreneurs that limits DGT from carrying out supervision due to data limitations. In addition, these sectors also received many VAT exemptions, which caused the revenue potential to decrease.

5. CONCLUSIONS

Based on the results and previous analysis, several things can be concluded that the alternative tax base measurement policy has a positive impact on increasing VAT revenue in the agricultural sector, which is 0.35% in 2021, and increasing the compliance level of the agricultural sector which reach 35.5% in 2021. An easier and fairer VAT policy can increase voluntary compliance in the agricultural sector so that more entrepreneurs will be obedient in fulfilling their tax obligations. However, the policy reduces the potential for national VAT revenue by -0.01% due to a decrease in the potential VAT revenue that occurs in other business sectors. The additional administration complexity of the VAT system due to the alternative policy harms the aggregate compliance rate.

The increase in revenue from business activities indicates an additional VAT burden for producers, which reduces disposable profit. It will exacerbate the regressivity of VAT, primarily for lower-profit producers. Although the input VAT burden can be transferred to the buyer through the selling price of the product, there is an unfair treatment of VAT on agricultural products compared to other sector products or imports that are free from VAT on production inputs. That will have an impact on the level of productivity and

competitiveness of the agricultural sector compared to other business sectors.

6. IMPLICATIONS AND LIMITATIONS

6.1 Implications and Recommendations

Based on the conclusions above, the agricultural sector's compliance rate of 35.5% indicates that this sector still has much potential for intensification and extensification to increase VAT revenues. Some policies can be applied, among others, by providing simple and fair VAT administration, increasing the tax knowledge of taxpayers, and focusing on monitoring sectors with high revenue potential and low levels of compliance.

Returning to the normal VAT mechanism is a preferred choice because of these strong considerations: the small economy of scale and uneven alternative policy impact on VAT revenue; the addition of VAT regressivity and unfair VAT treatment for producers in the agricultural sector; and an increasingly complex VAT system due to differences in VAT treatment. The normal VAT mechanism, theoretically, can generate more significant aggregate VAT revenue with minimal economic activity distortion.

However, the VAT best practice as a stable and efficient source of revenue through applying a single tariff and a broad tax base requires ideal conditions with as few administrative limitations as possible. Meanwhile, the agricultural sector, at least for now, has not been able to fulfill these ideal conditions due to the problem of informality. Thus, alternative policies are still needed during the transition period to accommodate farmers/agricultural entrepreneurs constrained by administrative issues and a limited understanding of tax provisions. The simple alternative method can increase the number of farmers/entrepreneurs in the agricultural sector involved in the VAT system. Thus, monitoring and increasing taxpayers' tax knowledge becomes more attainable. In this case, the alternative policy is regulated as a temporary policy with specific criteria and a limited time allowed to use the alternative method.

6.2 Limitations

The model used is static and does not explicitly consider changes in behavior in response to policy changes. This limitation arises from the assumptions used in preparing the input-output table, which makes the input or technical coefficients assumed to be constant during the analysis or projection period. The model cannot fully describe the actual conditions, so it is required to set several assumptions to accommodate these limitations. The process of generating the Input-Output table is assumed to be the same as the process of imposing a VAT. The criteria for determining the classification of business sectors in the input-output table are assumed to be the same as those for the Classification of Business Fields (KLU) determined by the DGT. The sample of DGT administration data used in the model is assumed to represent actual conditions at the population level, although there may be overstated/understated actual conditions.

Each business sector in the input-output table and KLU only produces one type of homogeneous output, although it may produce other outputs outside the main business in actual conditions. This assumption causes differences in the results of the estimated revenue potential based on the model with the actual revenue based on administrative data. An example is the hotel sector, which main output is providing accommodation, which is exempt from VAT because it is subjected to local tax. The model will estimate zero potential VAT revenue. Meanwhile, revenue based on actual data from the DGT administration allows VAT revenue from activities outside the main business, such as renting space for ATMs or shops.

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APPENDICE

Appendix 1 Full Compliance VAT Revenue Potential (Billion Rp)

Sector	No Alternative (a)	Condition 2021 (b)	% Impact (b-a)/a	Full Alternative (c)	% Impact (c-a)/a	No Alternative* (d)	Condition 2021* (e)	% Impact* (e-d)/d	Full Alternative* (f)	% Impact* (f-d)/d
Agriculture, Forestry and Fisheries	43.251	43.404	0,35%	61.400	41,96%	43.801	43.957	0,36%	62.203	42,01%
Mining and excavation	51.234	51.204	-0,06%	51.201	-0,06%	51.889	51.860	-0,06%	51.872	-0,03%
Processing industry	257.252	257.015	-0,09%	248.685	-3,33%	260.498	60.265	-0,09%	251.903	-3,30%
Electricity and Gas Supply	17.749	17.743	-0,04%	17.743	-0,04%	17.978	17.972	-0,03%	17.977	0,00%
Water Supply, Waste Management, Waste and Recycling	1.542	1.541	-0,07%	1.541	-0,09%	1.562	1.561	-0,07%	1.561	-0,06%
Construction	67.171	67.043	-0,19%	65.741	-2,13%	68.018	67.890	-0,19%	66.590	-2,10%
Wholesale and Retail Trade; Car and Motorcycle Repair	108.813	109.149	0,31%	109.120	0,28%	110.190	110.534	0,31%	110.536	0,31%
Transportation and Warehousing	56.583	56.576	-0,01%	56.576	-0,01%	57.296	57.291	-0,01%	57.307	0,02%
Provision of Accommodation and Food and Drink	20.815	20.748	-0,32%	19.922	-4,29%	21.079	21.011	-0,32%	20.181	-4,26%
Information and Communication	46.311	46.309	0,00%	46.309	0,00%	46.894	46.894	0,00%	46.907	0,03%
Financial Services and Insurance	16.789	16.782	-0,04%	16.780	-0,05%	16.958	16.952	-0,04%	16.954	-0,02%
Real Estate	71.638	71.638	0,00%	71.638	0,00%	72.540	72.541	0,00%	72.562	0,03%
Company Services	4.876	4.875	-0,03%	4.875	-0,03%	4.938	4.937	-0,03%	4.938	0,00%
Government Administration, Defense and Mandatory Social Security	26.543	26.521	-0,08%	26.414	-0,48%	26.878	26.857	-0,08%	26.756	-0,45%
Education Services	17.519	17.504	-0,09%	17.497	-0,13%	17.741	17.726	-0,08%	17.724	-0,09%
Health Services and Social Activities	15.625	15.608	-0,11%	15.585	-0,26%	15.825	15.807	-0,11%	15.788	-0,23%
Other Services	90.779	90.770	-0,01%	90.697	-0,09%	91.923	91.917	-0,01%	91.870	-0,06%
Total	914.491	914.430	-0,01%	21.723	0,79%	26.006	925.971	-0,00%	933.631	0,82%

*Taxable entrepreneurs can add input VAT burdens to product prices

Appendix 2 Policy Impact on Economic Agent (Billion Rp)

Agent	No Alternative (a)	Condition 2021 (b)	% Impact (b-a)/a	Full Alternative (c)	% Impact (c-a)/a	No Alternative* (d)	Condition 2021* (e)	% Impact* (e-d)/d	Full Alternative* (f)	% Impact* (f-d)/d
Consumer	461.098	460.180	-0,20%	458.492	-0,57%	466.842	465.925	-0,20%	464.351	-0,53%
Producer	383.889	384.747	0,22%	393.727	2,56%	388.786	389.666	0,23%	398.879	2,60%
Government	69.503	69.503	0,00%	69.503	0,00%	70.378	70.380	0,00%	70.400	0,03%
Total	914.491	914.430	-0,01%	921.723	0,79%	926.006	925.971	-0,00%	933.631	0,82%

*Taxable entrepreneurs can add input VAT burdens to product prices

Appendix 3 Compliance Rate of Each Business Sector

Sector	2021	2016	2019	2020
Agriculture, Forestry and Fisheries	35,46%	27,72%	23,73%	19,75%
<i>Crops</i>	1,98%	0,96%	1,08%	1,09%
<i>Horticultural Plants</i>	3,36%	1,90%	2,32%	1,91%
<i>Plantation crops</i>	84,39%	61,20%	50,75%	46,02%
<i>Forestry and Logging</i>	113,83%	154,72%	120,94%	89,52%
<i>Farm</i>	1,16%	2,09%	2,60%	0,63%
<i>Fishery</i>	11,48%	13,02%	17,97%	11,10%
<i>Agricultural and Hunting Services</i>	63,72%	53,42%	61,08%	57,14%
Mining and excavation	162,20%	114,17%	113,00%	96,01%
Processing industry	71,58%	72,30%	71,09%	62,22%
Electricity and Gas Supply	28,69%	52,63%	48,44%	31,00%
Water Supply, Waste Management, Waste and Recycling	81,20%	66,17%	76,53%	63,51%
Construction	88,53%	121,01%	111,44%	54,67%
Wholesale and Retail Trade; Car and Motorcycle Repair	156,54%	141,12%	144,82%	119,34%
Transportation and Warehousing	28,36%	22,76%	22,39%	24,78%
Provision of Accommodation and Food and Drink	N/A	N/A	N/A	N/A
Information and Communication	39,28%	45,35%	36,30%	32,38%
Financial Services and Insurance	42,61%	52,15%	41,36%	37,19%
Real Estate	13,40%	17,19%	15,17%	11,46%
Company Services	55,23%	69,99%	64,68%	51,33%
Government Administration, Defense and Mandatory Social Security	3632,95%	4280,12%	4361,33%	1933,15%
Education Services	N/A	N/A	N/A	N/A
Health Services and Social Activities	N/A	N/A	N/A	N/A
Other Services	2,77%	3,66%	3,79%	2,85%
Total	65,59%	66,13%	64,44%	53,57%